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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HU, HENRY S

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/542,545	Applicant(s) NISHIMURA ET AL.	
	Examiner Henry S. Hu	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Election of May 23, 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 7-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☒ Claim(s) 1-9 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. As discussed earlier, USPTO has received **Pre-Amendment** and **two IDS** (1 page each) filed on July 18, 2005, July 18, 2005 and March 29, 2007 respectively. **Claims 1, 3-6 and 9 were amended**, while no claim was cancelled or added. To be specific, the claim amendments were only to remove improper multiple dependency on dependent Claims 3-6 and 9 as well as to correct a typographical error on parent Claim 1. In response to restriction requirement filed on April 23, 2007, Applicants have elected **without traverse** for **Group I (Claims 1-6)**.

Claims 1-9 with **two** independent claims (**Claim 1 and Claim 7**) are pending now, while nonelected **Claims 7-9 (Group II)** are withdrawn from consideration. An action follows.

Claim Objections

2. Claim 1 is objected to because of the following informalities:

On **Claim 1** at line 7, the language of “wherein ethylenically unsaturated compounds” is improper with no support. Based on the fact that only **monomers** are shown on line 6, the Examiner suggests changing it to “wherein the monomers”.

Claim Rejections - 35 USC § 112

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3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On **Claim 5** at lines 2-6, the sentence of "the fluoroolefin **contains a compound selected from the group consisting of A, B, C, D,... and a functionalized compound** having the following formula" may render claim **indefinite**. In one way, the functionalized compound with the formula may be necessary. In the other way, the functionalized compound with the formula may be only optional. Rewriting the sentence with a more clarified language is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness

or nonobviousness.

6. The limitation of parent **Claim 1** relates to **a process for preparing a fluorine-containing polymer, which is a batch copolymerization process conducted under conditions of reduced temperature of at least 0.95 and reduced pressure of at least 0.80 of the critical constant calculated from critical temperature, critical pressure and composition ratio of each monomer in the gaseous phase of the reaction vessel using the Peng-Robinson formula as specified, wherein**

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ethylenically unsaturated compounds containing at least one fluoroolefine fluoroolefin are copolymerized in the presence of a compound having the formula: $Rf^I(I)_x$ as specified.

See other limitations of dependent Claims 2-6.

7. **Claims 1-6** are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over each of **Carlson (JP 05-222130), Saito et al. (WO 00/47641) and Kitaichi et al. (WO 00/01741 or its equivalent US 6,509,429 B1).**

Three sets of 102/103 rejections are applied. Regarding the process limitation of parent **Claim 1**, each of **three** references including **Carlson, Saito and Kitaichi** has individually disclosed **a “batchwise” polymerization process for making fluoropolymers by using reduced temperature and reduced pressure,** wherein the copolymerization is achieved **in the presence of an iodine-containing compound having within the claimed formula: $Rf^I(I)_x$,** which is known in the art to be useful as chain transfer agent. After unit conversion to the same unit for pressure used in dependent Claim 2, the reduced numbers for temperature and pressure in combination with weight ratio of monomers are found in some working examples to be overlapping and/or at least close to the claimed numbers for temperature and pressure calculated from the claimed **Peng-Robinson formula.**

8. To be specific, see **Carlson** at working examples 1-5 for “batchwise polymerization”; the reduced temperature (25-150 °C) and the reduced pressure (8-80 atmospheres, which can be converted to 0.74-7.84 Mpa since 1 atmosphere = 0.09807 MPa) for polymerization (see

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paragraphs 0017-0018); the use of fluorinated monomers such as VDF, HFP and TFE at abstract, line 1-7; see the use of various iodine-containing compound at paragraph 0010, which is reading on the claimed $Rf^I(I)_x$.

See **Saito** at working examples 1-3 for “batchwise polymerization”; the reduced temperature ($80\text{ }^{\circ}\text{C}$) and the reduced pressure (at least 30 kgf/cm^2 , which can be converted to **2.94 MPa** since $1\text{ kgf/cm}^2 = 0.09806\text{ MPa}$) for polymerization; the use of fluorinated monomers such as VDF, HFP and TFE at abstract, line 1-7; pages 10-12; see the use of various iodine-containing compound having formula (1) at pages 19-20, which is reading on the claimed $Rf^I(I)_x$.

See **Kitaichi** at working examples 1-4 for “batchwise polymerization”; the reduced temperature ($95\text{ }^{\circ}\text{C}$) and the reduced pressure (**4.2 MPa**) for polymerization; the use of fluorinated monomers such as VDF, HFP and TFE on page 15 at bottom section; see the use of various iodine-containing compound having formula (1) at pages 12-13, which is reading on the claimed $Rf^I(I)_x$.

9. In a very close examination, each reference is still silent about **the polymerization factors such as critical temperature, critical pressure and the composition ratio of monomers are “all” following Peng-Robinson formula**. Based on the rationale that polymerization from prior art and instant application may use fundamentally the same iodine-containing compound and the same monomer mixture as disclosed in instant parent Claim 1

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along with its dependent Claims 4 and 5 as well as the fluoropolymer may be prepared from the same or at least similar batchwise polymerization, a reasonable basis exists to believe that the polymerization of the invention inherently possess the same factors following Peng-Robinson formula. Since the PTO cannot perform experiments, the burden is shifted to the applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP 2112-2112.02.

It has been held that where applicant claims a composition in terms of function, property or characteristic where said function is not explicitly shown by the reference and where the examiner has explained why the function, property or characteristic is considered inherent in the prior art, it is appropriate for the examiner to make a rejection under both the applicable section of 35 USC 102 and 35 USC 103 such that the burden is placed upon the applicant to provide clear evidence that the respective compositions do in fact differ. *In re Best*, 195 USPQ 430, 433 (CCPA 1977); *In re Fitzgerald et al.*, 205 USPQ 594, 596 (CCPA 1980).

10. Regarding **Claim 2**, the reduced pressures in the unit of Mpa used by the involving references are overlapping with the claimed numbers.

Regarding the number of fluoropolymer particles in Claim 3 and the Mooney viscosity in Claim 6, the same rational with inherent property in the rejection of parent Claim 1 can be applied here to reject Claims 3 and 6.

Regarding **Claims 4 and 5**, fluorinated monomers used by the involving references are VDF, HFP, TFE and the like as discussed above. The fluoroolefin mentioned in Claim 5 may have 112-2nd paragraph issue as discussed above.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a process for preparing a fluorine-containing polymer with reduced temperature and reduced pressure following the Peng-Robinson formula as well as it is copolymerized **in the presence of a compound having the formula: $Rf^I(I)_x$:**

US 6,806,332 B2 to Royer et al. or US 6,914,105 B1 to Charpentier et al. only discloses the preparation of continuous copolymerization in carbon dioxide medium (see abstract and title). **Peng-Robinson formula is mentioned** (see "105" at column 14, line 57-58; see "332" at column 17, line 58-59). Although fluorinated monomers are involved (see "105" at column 6, line 27-32; see "332" at column 5, line 57-62), **the process is NOT a batchwise polymerization.** Additionally, iodine-containing compound is NOT used or suggested.

12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization

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where this application or proceeding is assigned is (571) 273-8300 for all regular communications.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

July 18, 2007



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